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ABSTRACT

A random sample of 150 farmers (75 participants and 75 non-participants in radio forums) from Lahore and Gujrat districts in West Pakistan were surveyed via personal interview in 1971 to determine whether there was a relationship between: certain socioeconomic variables and farmer forum participation; radio forums and agricultural change, including acceptance of new farm practices; the most effective information sources and such changes. Chi-squares and corrected contingency coefficients were computed in order to determine any possible association between selected personal factors and farmer participation and the impact of participation upon change. Data revealed: farmers with higher levels of education, larger families, larger farms, higher incomes, organizational membership, city exposure, and favorable attitudes toward the forums tended to participate more in the radio forums than those without such characteristics; forum members had better knowledge of new agricultural practices, better attitudes toward such practices, and higher adoption rates than non-members; the radio forum program was one of the most effective information sources affecting change. Since it appeared that extension agents tended to concentrate on wealthier farmers, it was suggested that concentration on low income farmers would help mitigate the socioeconomic gap in this developing nation. (JC)

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Seminar #3

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# THE IMPACT OF FARM RADIO FORUM ON THE DIFFUSION OF INNOVATIONS IN LAHORE AND GUJRAT DISTRICTS OF WEST PAKISTAN

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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# IMPACT OF FARM RADIO FORUMS ON DIFFUSION OF INNOVATIONS IN LAHORE AND GUJRAT DISTRICTS OF WEST PAKISTAN[1]

by

Salah M. Yacoub, Fawzi M. Al-Haj and Mohammad Azam Khan[2]

## INTRODUCTION

Developing agriculture and increasing its productivity are among the most urgent goals which governments in the developing countries have to achieve if they are to cope successfully with the increasing demand for food resulting from rapidly growing population. More than 80 percent of Pakistan's population depends on agriculture directly or indirectly (Government of Pakistan, 1961). A large number of agriculturists are subsistance farmers who produce only enough for their own living. The aim of the government should be to bring these subsistance farmers into a market economy by raising their productivity.

Due to lack of transport facilities and adequate trained personnel in the extension wing of the agriculture department, the contact with farmers was limited, and this was a major cause for the limited diffusion of improved agricultural practices. To overcome this problem and to boost its «grow more food cam-

(1) Approved for publication as Journal No. 403 by the Faculty of Agricultural Sciences of the American University of Beirut on January 17, 1973.

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paign», the Government of Pakistan decided to make use of radio broadcasting for its speedy distribution of news.

Keeping in view the limitations of radio being a one way communication, the «radio forum»[3] program was introduced in 1966. Recently, however, some questions were raised by the program planners and other people working with the extension service as to the real impact which the new approach has on introducing certain changes, including the dissemination of agricultural information, among the Pakistan farmers.

Such question called for an empirical investigation to assess the situation. The specific objectives of this study were to determine: (1) Whether there is a relationship between certain selected socio-economic and psychological characteristics and farmers' participation in the radio forums, (2) Whether a relationship exists between participation in radio forums and farmers' level of knowledge regarding improved practices[4], their attitudes toward such practices and their adoption of them, and farmers' participation in extension type activities, and (3) Which source of information, among the various sources available to rural masses, seemed to be more effective in introducing changes among farmers.

## METHODS AND PROCEDURES

The study was done in two districts of West Pakistan, namely Lahore and Gujrat districts by interviewing a sample of 150 farmers half of which were members in the radio forums, and the other half were non-members. The list of the farm radio clubs in the two districts was obtained from the program planners at Radio Pakistan of Lahore and from the Bureau of Agricultural

(3) A radio forum is a discussion group of 10-20 farmers who listen in an organized way to the radio program, discuss the contents of the program and communicate their discussion to the program.

(4) These include the improved varieties of some major crops like wheat, rice, sugarcane, cotton and maize, and the recommended fertilizers and insecticides which should be used on such major crops.

Information, Department of Agriculture, Lahore. A total number of 32 radio clubs existed in 32 villages, 18 in Lahore district and 14 in Gujrat district, with a membership of 484 farmers ranging from 10-20 in each club. Six radio clubs in six different villages, three from each district, were randomly selected. A list of their members was then obtained from the extension agents concerned and a total of 75 farmers were selected randomly. The number of farmers selected from each club ranged from 12-13 (Table 1).

The list of farmers who were not members and were living in the same six villages from which the 75 members were selected was obtained from the extension agents. This list was further verified by the village heads and the Revenue Department and a total of 75 farmers were selected randomly by taking 12-13 from each village.

Table 1. Sample distribution over the various villages selected, summer 1971.

| Name of village or town | Name of district | Number of respondents | | Total |
|---|---|---|---|---|
| | | Members | Non-Members | |
| Luliani | Lahore | 13 | 13 | 26 |
| Shamke Bhattian | Lahore | 12 | 12 | 24 |
| Ali Raza Abad | Lahore | 13 | 13 | 26 |
| Lalamusa | Gujrat | 13 | 13 | 26 |
| Thekarian | Gujrat | 12 | 12 | 24 |
| Deona | Gujrat | 12 | 12 | 24 |
| Total | | 75 | 75 | 150 |

A questionnaire was prepared and data were obtained during the summer of 1971 by using face-to-face interviewing. The first few interviews were conducted in the office of the extension agent, however, it was felt that it was difficult to have privacy with the interviewees. Farm and home visits were utilized thereafter.

## PREVIOUS RESEARCH

The number of studies which dealt with the influence of selected factors such as age, education, size of farm, tenure status, organizational membership, income derived from farming, exposure to city life and attitudes on social participation is large indeed.[5] Only few selected studies on organizational participation which had a direct bearing on the formulation of the research problem under investigation were reviewed. In their study on factors influencing farmers' participation in a Lebanese village cooperative, Yacoub and Haddad (1970:7) found that personal characteristics such as tenure status, size of farm owned, level of education, age and income derived from farming did not affect farmers' participation in the cooperative, while their attitudes toward it affected their participation significantly and in a positive way. Hardee (1961) reported a positive relationship between social stratification and participation in Australian rural community, and Benvenuti (1962:254-255) reported similar findings for a sample of Dutch farmers. Reissman (1953) found that income, occupation, or education (which were used as indicators of stratification) were positively related to participation; those in the higher social status categories participated more than those in the lower social status categories. Van Es and Whittenbarger (1970:20) found that participation in farm organizations and extension programs were significantly and positively related to both farm ownership and size of the farm owned. Hodge and Treiman (1968) found that family income, education, and occupation differed in their effects on affiliation and church attendance. Family income, for example, exerted a larger effect on number of memberships than it did on church attendance. Beal (1956) found that age, education, size of farm, and tenure status were not cor-

(5) This is especially true if one considers adoption of new farm practices as an example of social participation (Reeder, 1967). Rural sociologists have completed over 286 diffusion studies since the classic investigation of hybrid seed corn adoption by Ryan and Gross in 1943 (Rogers, 1962, p. 4). One hundred studies dealing with adoption of new ideas and practices were reviewed by lionberger (1960) and over 500 studies on the same subject were reviewed by Rogers (1962). The reader is advised to refer to these sources for a thorough review of previous research on the subject.

related with participation, but that general social participation and socioeconomic status were relate[d] me of the larger correlations in his study involved dynan[ic] ariables such as attitudes toward and beliefs about the cooperative. Folkman (1955) found a positive relationship between farm ownership and farmers' attitudes toward the cooperative and their participation in it.

Studies relating exclusively to radio as an educational medium in the diffusion of farm information are few in number and throw a little light on the role actually played by radio in the sequence of influences involved in bringing about a change. Rao (1966:97-100) demonstrated that communication through radio helps a person find alternative ways of living, raises family's economic status, and motivates the illiterate to become literate. Shea **et al.** (1954:216-223) found that participation in radio forums particularly affected farmers' attitude toward department of agriculture and the related agencies. Their participation in these organizations was increased. Roy **et al.** (1969:103) maintained that increase in knowledge and rate of adoption of agricultural and health innovations were significant in radio forum villages. He also demonstrated that participation in radio forums increased the aspirational level of farmers. There was a significant relationship between the degree of participation and the amount of change.

## HYPOTHESES

The following three major hypotheses were tested in this study:

1. Participation in radio forum program is influenced by farmer's age, level of education, size of farm owned or operated, land tenure status, size of farm family, membership in other organizations, income derived from agriculture, rate of exposure to city life, and opinions and attitudes toward the radio forum program.

2. Participation in radio forums is related positively to

farmers' attitudes toward selected improved agricultural practices, their knowledge and rate of adoption of such practices and their participation in extension type of activities such as attendance of meetings and demonstrations.

3. Compared to other sources of information available to farmers, radio forum program is the most effective source in introducing change among them.

## ANALYSIS AND FINDINGS

### A. Selected Personal Factors and Their Influence on Participation

As it was hypothesized, personal characteristics such as education, size of family, size of farm, organizational membership, income derived from farming, exposure to city life and attitudes toward radio forums were significantly related to farmers' participation[6] in radio forums. Age and land tenure status, however, were not found to be related to participation in radio forum (Table 2 and Appendix A, Tables 1-9).

Table 2. Relationship between selected personal factors and farmers' participation in radio forums, summer 1971.

| Factor | $X^2$ | d. f. | $\bar{C}$ |
|---|---|---|---|
| Age | 2.77 | 3 | 0.18 |
| Education | 9.18* | 3 | 0.32 |
| Size of family | 9.46** | 2 | 0.36 |
| Size of farm | 15.06** | 4 | 0.40 |
| Land tenure | 0.76 | 1 | 0.11 |
| Organizational membership | 12.29** | 2 | 0.48 |

(6) This was measured simply in terms of whether respondents were members in the radio forums or not. Once they are members, they automatically have to attend the meetings of the forums and participate in the discussion of the farm radio program.

| | | | |
|---|---|---|---|
| Income from farming | 58.48*** | 2 | 0.77 |
| Exposure to city life | 11.08*** | 1 | 0.41 |
| Attitudes toward the helpfulness of the radio forums | 66.24*** | 1 | 0.88 |

* Significant at 0.05 level.
** Significant at 0.01 level.
*** Significant at 0.001 level.

**B. Participation in Radio Forums and Its Influence on Change**

It was hypothesized that participation in radio forums will influence farmers' knowledge of certain recommended agricultural practices, their attitudes toward such practices, their adoption of them, and their participation in extension type activities such as making more contacts with extension agents in their areas and attending more demonstrations.

1. **Knowledge of agricultural innovations:**

Participation in radio forums seemed to influence the level of knowledge[7] farmers have of the improved varieties of certain major crops such as wheat, rice, sugarcane, cotton and maize; and of the recommended fertilizers and insecticides which should be applied on such crops. About two fifths of the non-participants had «low» level of knowledge of the improved practices, whereas four fifths of the participants as compared to about one fifth of the non-participants had «high» level of knowledge re-

(7) A level of knowledge score was developed for each respondent by asking him 11 questions (See Appendix B, Part I) related to the improved agricultural practices being recommended and assigning a score of «1» if he gave the correct answer to the question and a score of «0» if he gave a wrong answer. The correct answers for each geographical area were determined and identified by its extension agent. Total knowledge score was obtained by adding the scores received on all eleven questions and it ranged from 0-11. Respondents were then grouped into three categories: those having «low» level of knowledge with a score ranging from 0-7, «medium» level of knowledge with a score ranging from 8-10, and «high» level of knowledge with a score of 11 and above.

garding such practices (Table 3). The relationship between participation in radio forums and knowledge of the recommended agricultural practices was significant at the 0.001 level. The amount of relationship measured by the $\bar{C}$ value was 0.81.

Table 3. Participation in radio forums as it relates to knowledge farmers have of improved practices, summer 1971.

| Level of Knowledge | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Low | 0 | 0 | 33 | 44 | 33 | 22 |
| Medium | 15 | 20 | 29 | 39 | 44 | 30 |
| High | 60 | 80 | 13 | 17 | 73 | 48 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 67.71$ ; 2 d.f. ; $P < 0.001$ ; $\bar{C} = 0.81$.

2. **Attitudes toward innovations:**

Respondents' attitudes[8] toward the recommended farm practices seemed to be related to participation in radio forums. More than one third of the forums' non-members as compared to none of the members had unfavourable attitudes toward the selected agricultural innovations, whereas almost all the members and one fourth of the non-members had «highly» favourable attitudes toward the improved practices (Table 4). The relationship between participation in radio forums and attitudes toward innovations was significant at the 0.001 level. The degree of relationship was 0.90.

(8) Attitudes were measured by using seven different questions (See Appendix B, Part II) and assigning scores to their answers. A total attitude score was then obtained for each respondent by adding the scores received on all seven questions. The total attitude score ranged from 0-10 and respondents were then classified on the basis of the score which they received as follows: respondents with «least» favourable attitudes having a score of 3-5, «medium» favourableness having a score of 6-9, and «highly» favourable attitudes having a score of more than 9.

Table 4. Participation in radio forums as it relates to farmers' attitudes toward improved practices, summer 1971.

| Attitude | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Least favourable | 0 | 0 | 28 | 37 | 28 | 18 |
| Medium favourableness | 1 | 1 | 30 | 40 | 31 | 20 |
| Highly favourable | 74 | 99 | 17 | 23 | 91 | 62 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 87.67$ ; 2 d.f. ; $P < 0.001$ ; $\overline{C} = 0.90$

3. **Adoption of improved farm practices:**

Farmers' participation in the radio forums and their rate of adoption[9] of the improved farm practices were positively and significantly related. Two fifths of the non-participants as compared to none of the participants were found to have «low» rate of adoption (Table 5). On the other hand, four fifths of the participants as compared to one fifth of the non-participants were found to have high adoption rates.

4. **Participation in extension-type activities:**

Extension-type activities include the contacts which farmers had with extension agents, such as home and farm visits, office calls and attendance of demonstrations conducted by agents. It was hypothesized that farmers' participation in radio forums and their participation in extension-type activities will be related to

(9) Six questions (See Appendix B, Part III) were used to measure the rate of adoption for each respondent. Farmers were asked whether they follow the recommended practices and an adoption score was developed by assigning «1» point if the farmer was using the practice and a zero point if he was not following it at all or was not using it properly. A total score was obtained by adding the scores received on all six questions and respondents were then classified into three main categories based on total adoption scores they possessed as follows: those with «low» adoption rate have a score ranging from 0-2, «medium» adoption have a score of 3-4, and «high» adoption rate have a score of above 4.

each other, because after listening to radio forum programs farmers' interest to acquire more knowledge about the contents of such programs will increase. During this information seeking stage, farmers need to expose themselves to more sources of information particularly to demonstrations and contacts with extension agents.

Table 5. Participation in radio forums as it relates to adoption of improved practices, summer 1971.

| Adoption rate | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Low | 0 | 0 | 29 | 39 | 29 | 20 |
| Medium | 14 | 19 | 33 | 44 | 47 | 30 |
| High | 61 | 81 | 13 | 17 | 74 | 50 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 67.82$ ; 2 d.f. ; $P < 0.001$ ; $\bar{C} = 0.081$

Both participants and non-participants in the radio forums were found to have made several contacts during the year preceeding the interview with the extension agents in their areas. None of the respondents, except one, were found to have made no contacts at all with the extension agent of his area. When comparing the frequency of meetings which both participants and non-participants had with extension agents however, it was found that 85% of the participants as compared to 45% of the non-participants contacted the extension agent «very often» (Table 6). On the other hand, 55% of the non-participants as compared to only 14% of the participants contacted the agent «occasionally». The relationship between participation in forums and frequency of contacts the respondents had with extension agents was significant at the 0.01 level.

A large majority of the respondents (96%) attended demonstrations «occasionally» or «very often» (Table 7). Only 4% indicated that they never attended any demonstration. When those

Table 6. Participation in radio forums as it relates to farmers' contacts with extension agents, summer 1971.

| Frequency of Annual Contacts | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Very often (49-120 contacts) | 64 | 85 | 34 | 45 | 98 | 65 |
| Occasionally (1-48 contacts) | 10 | 14 | 41 | 55 | 51 | 34 |
| Never (0 contacts) | 1 | 1 | 0 | 0 | 1 | 1 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 24.34$ ; 2 d.f. ; $P < 0.01$ ; $\bar{C} = 0.59$

who attended demonstrations were asked how often they attended them, 97% of the participants in the radio forums as compared to 35% of the non-participants attended them «very often». On the other hand 59% of the non-participants in the forums and only 3% of the participants attended them «occasionally». The relationship between participation in the forums and attendance of demonstrations was significant at the 0.001 level.

Table 7. Participation in radio forums as it relates to participation in demonstrations, summer 1971.

| Frequency of annual attendance | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Very often (8-14 times) | 73 | 97 | 26 | 35 | 99 | 66 |
| Occasionally (1-7 times) | 2 | 3 | 44 | 59 | 46 | 30 |
| Never (0 time) | 0 | 0 | 5 | 6 | 5 | 4 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 61.35$ ; 2 d.f. ; $P < 0.001$ ; $\bar{C} = 0.80$

## C. Most Effective Information Source in Introducing Change Among Farmers

In this study four types of information sources which usually affect changes in rural areas of Pakistan were considered, and their impact on changing farmer's knowledge of improved practices, their attitudes toward such practices and their rate of adoption of them were compared. These four types of information sources were:

1. Participation in extension-type activities[10] such as meetings with extension agents and attending demonstrations.
2. Exposure to mass media[11] such as newspapers, agricultural magazines and radios.
3. Exposure to city life[12], and

---

(10) Two questions were used to measure this variable (See Appendix B, Part IV): the first revealed the number of times respondents met with extension agents in their villages and received agricultural information from them during the year preceeding the interview, and the second revealed the number of times they attended demonstrations conducted by extension agents. For the first question, a zero point was given to those who never met with extension agents, one point for those who met with him 25 times or less, two points for meeting with him 26-48 times, and three points for 49-120 times. For the second question, a zero point was given if the respondent never attended any demonstration, one point for four demonstrations or less, two points for attending 5-7 demonstrations, and three points for 8-14 demonstrations. A score for participation in extension-type activities was then developed for each respondent and it ranged from 0-6. Those having a score of 1-2 were classified as having «low» participation in extension-type activities, 3-4 as «medium», and 5-6 as «high».

(11) Exposure to mass media was measured by asking respondents how often they read newspapers and agricultural magazines, and how often they listen to radio. A zero point was given for «rarely», one point for «once a week», two points for «twice or thrice a week», and three points for «daily». An exposure to mass media score was then developed for each respondent and it ranged from 0-9. Those with a score of 0-3 were considered as having «low» exposure to mass media, 4-6 as «medium», and 7-9 as «high».

(12) This variable was measured in terms of number of times the respondent visited the city during the last 12 months. If he visited the city 12 or more times he is considered as being «highly» exposed to city life, while if his visits during the year did not exceed 3-4 times he is considered as being «little» exposed to city life.

4. Participation in radio forum program.

All four sources of information were found to be important in favourably changing farmers' knowledge and rate of adoption of improved farm practices and their attitudes toward them (See Table 8 and Appendix A, Tables 10-12). In order to determine which one of the four sources had the greatest impact on change, the amount of relationship, as measured by the value of corrected contingency coefficient ($\bar{C}$), between the area of change and using each of the four sources was examined. It is assumed that the higher the degree of relationship the greater the impact of the source on the area of change. It was found that, other things being equal, the impact of participation in radio forums on introducing change in the three areas investigated was the greatest. This was followed by participation in extension-type activities and exposure to city life. Exposure to mass media seemed to be least influential since most farmers in West Pakistan are illiterate and their use of printed material becomes limited.

Table 8. Comparison of the degree of relationships between different sources of information and the different areas of change, summer 1971.

| Source of information | Degree of relationship (value of $\bar{C}$) | | |
|---|---|---|---|
| | Change in knowledge | Change in attitudes | Change in rate of adoption |
| Participation in extension-type activities | 0.78 | 0.75 | 0.76 |
| Exposure to mass media | 0.45 | 0.48 | 0.45 |
| Exposure to city life | 0.72 | 0.74 | 0.77 |
| Participation in radio forum program | 0.81 | 0.90 | 0.81 |

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purposes of this study were to determine: (1) whether

there is a relationship between certain socio-economic variables and farmers' participation in the radio forums, (2) the impact of radio forums on introducing certain changes, including acceptance of new farm practices, among the Pakistani farmers, and (3) the most effective information source in introducing such changes among them.

A random sample of 150 farmers, 75 participants in radio forums and 75 non-participants, was selected from two districts of West Pakistan. Data were obtained by personal interviews during the summer of 1971.

Chi-squares and corrected contingency coefficients were computed in order to determine any possible association between selected personal factors and farmers' participation in radio forums, and the impact of participation in such forums on the various changes considered.

The data revealed that farmers with higher levels of education, larger families, larger farms, and higher farm incomes, and farmers who were members in other farm organizations, were exposed to city life, and had a favourable attitudes toward the forums tended to participate more in the radio forums than those who did not possess such characteristics. Farmers' ages and their land tenure status did not affect their participation in the forums. One may conclude from such findings that there is a tendency for extension agents who are responsible for organizing the forums to concentrate on the well-to-do farmers and try to select them as members on the account of the subsistance farmers who needed help the most. This tendency is agaist the basic philosophy of extension service and it can contribute to the broadening of the socio-economic gap in a developing country such as Pakistan. It is recommended, therefore, that concentrating the activities on the well-to-do farmers should be discouraged and a uniformity be maintained in order to reach the low income farmers.

The data also revealed that members of the forums had

better knowledge of the new agricultural practices than the non-members. Furthermore, their attitudes towards such practices were more favourable than those of the non-members; and adoption of the practices by the former group was higher than that by the latter. Members of the forums participated in extension-type activities more than the non-forum members (Table 9). Thus, it is recommended that membership in radio forums should be open to all peasants, especially to tenants and farmers with small size holdings, if they are to change and develop.

Table 9. Relationship between participation in radio forums and various changes, a summary table.

| Various changes considered | $X^2$ | d.f. | $\bar{C}$ |
|---|---|---|---|
| Knowledge about agricultural practices | 67.71* | 2 | 0.81 |
| Attitudes toward new agricultural practices | 87.67* | 2 | 0.90 |
| Adoption of new practices | 67.82* | 2 | 0.81 |
| Participation in extension-type activities | | | |
| (1) Contacts with extension agent | 39.85* | 2 | 0.67 |
| (2) Attending demonstrations | 44.98* | 2 | 0.70 |

* Significant at 0.001 level.

It was evident from the findings that the radio forum program was one of the most important sources of information (compared to other sources being used) in conveying useful information regarding agriculture among the rural masses of the two districts studied. If radio forums are to increase their impact, it is recommended that the small number of organized and registered radio forums already functioning in Pakistan be increased by organizing and strengthening the large number of informal radio forums which are available throughout the rural

villages of Pakistan. There is a definite need for the field staff of the agricultural extension department to increase the quality and the quantity of these radio forums and to have them cover a much wider agricultural area than that already covered.

The multi-organizational sponsorship of the radio forum program constituted one of its major limitations. Being sponsored by the Ministry of Information and Broadcasting at the central government level, the Bureau of Agricultural Information, and by the Extension wing of the Agricultural Department, each tried to put the merits of the program under its own name and blamed the others for any flow in the program. Lack of coordination among these sponsoring agencies was evident and if the program is to succeed a higher degree of coordination among the agencies concerned must be achieved.

In addition to the recommendations stated above, the following may be advanced to cover three different levels: The Government, the Agricultural Extension Department, Radio Pakistan, and the Government.

**A. Agricultural Extension Department:**

1. The radio forum program, being one of the extension teaching methods, had also some close associations with other activities of the department. A close working relationship between the people working in the field and those responsible for operating the program should be developed and maintained.

2. The field staff should be given adequate training to bring their knowledge up-to-date and to help them cope with the diverse problems facing the rural population of Pakistan.

3. In order to determine the role of the radio forum program at different stages of the adoption process, a comparative study of the effectiveness of different teaching methods should be made.

**B. Radio Pakistan:**

1. The administration at various radio stations should always keep in mind the importance of agriculture in the country. Sufficient time, therefore, should be allocated to this program so that the speaker can thoroughly explain the problem under consideration and the alternative solutions.

2. The department of agriculture may be required to provide only capable and experienced persons to work with the program so that they can organize it more effectively.

3. Only well experienced, qualified and reputed persons should be allowed to speak on the radio because farmers give high value to radio talks and try to act according to what they hear from radio. Personal interests and publicity should be discouraged.

**C. The Government:**

1. The government has to supply the agriculture department with a great number of trained personnel. The staff should be properly motivated to perform their jobs more effectively.

2. The government should allocate more budget for the radio forum to make further improvements according to the changing conditions and needs.

3. Agricultural inputs like seed, fertilizer, credit and other related material should be made available to farmers at the proper time and at reasonable prices. Irrigation facilities also need improvements. A forum must be supported by actual and effective agricultural policies if its goals are to be achieved.

4. The marketing system is also defective. Farmers do not find facilities for disposal of their surplus produce. This was one of the main hurdles in adoption of new agricultural practices. An efficient and easy marketing system should be provided.

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## APPENDIX A

Table 1. Education in relation to participation in radio forums, summer 1971.

| Level of Education | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Illiterate | 16 | 21 | 27 | 36 | 43 | 28 |
| Read and write only | 17 | 23 | 24 | 32 | 41 | 27 |
| Elementary education | 20 | 27 | 10 | 13 | 30 | 20 |
| High school education and above | 22 | 29 | 14 | 19 | 36 | 25 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 9.18$ ; 3 d.f. ; $P < 0.05$ ; $\bar{C} = 0.32$

Table 2. Size of family in relation to participation in radio forums, summer 1971.

| Size of Family | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| 2-4 members | 14 | 19 | 31 | 41 | 45 | 30 |
| 5-7 members | 55 | 73 | 41 | 55 | 96 | 64 |
| 8 or more members | 6 | 8 | 3 | 4 | 9 | 6 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 9.46$ ; 2 d.f. ; $P < 0.01$ ; $\bar{C} = 0.36$

Table 3. Size of farm in relation to participation in radio forums, summer 1971.

| Size of Farm (in acres) | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| 1 — 10 | 1 | 1 | 12 | 16 | 13 | 8 |
| 11 — 20 | 16 | 21 | 22 | 29 | 38 | 26 |
| 21 — 30 | 32 | 43 | 28 | 37 | 60 | 40 |
| 31 — 40 | 18 | 24 | 8 | 11 | 26 | 18 |
| More than 40 | 8 | 11 | 5 | 7 | 13 | 8 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 15.06$ ; 4 d.f. ; $P < 0.01$ ; $\overline{C} = 0.40$

Table 4. Organization membership in relation to participation in radio forums, summer 1971.

| Membership in organizations | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| None | 12 | 16 | 33 | 44 | 45 | 30 |
| Member in one organization | 16 | 21 | 6 | 8 | 22 | 14 |
| Member in two organizations | 47 | 63 | 36 | 48 | 83 | 56 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 12.29$ ; d.f. ; $P < 0.01$ ; $\overline{C} = 0.48$

Table 7. Attitudes toward the helpfulness of the forum program in relation to participation in it, summer 1971.

| Attitudes | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Much helpful | 74 | 99 | 26 | 35 | 100 | 66 |
| Helpful to some extent | 1 | 1 | 49 | 65 | 50 | 34 |
| Not helpful | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 66.24$ ; 1 d.f. ; $P < 0.001$ ; $\overline{C} = 0.88$

Table 8. Age in relation to participation in radio forums, summer 1971.

| Age | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| 25 years or less | 2 | 3 | 1 | 1 | 3 | 2 |
| 26 — 35 years | 21 | 28 | 14 | 19 | 35 | 24 |
| 36 — 45 years | 41 | 55 | 44 | 59 | 85 | 56 |
| Above 45 years | 11 | 14 | 16 | 21 | 27 | 18 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 2.77$ ; 3 d.f. ; $P > 0.05$ ; $\overline{C} = 0.18$

Table 9. Land tenure status in relation to participation in radio forums, summer 1971.

| Tenure Status | Participants | | Non-Participants | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Owner operators | 70 | 93 | 67 | 89 | 137 | 92 |
| Tenants | 5 | 7 | 8 | 11 | 13 | 8 |
| Total | 75 | 100 | 75 | 100 | 150 | 100 |

$X^2 = 0.76$ ; 1 d.f. ; $P > 0.05$ ; $\overline{C} = 0.11$

Table 10. Participation in extension-type activities as it affects adoption of improved practices, summer 1971.

| Level of adoption | Low Participation | | Medium Participation | | High Participation | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Low | 24 | 60 | 5 | 6 | 0 | 0 | 29 | 19 |
| Medium | 14 | 35 | 27 | 32 | 6 | 24 | 47 | 31 |
| High | 2 | 5 | 53 | 62 | 19 | 76 | 74 | 50 |
| Total | 40 | 100 | 85 | 100 | 25 | 100 | 150 | 100 |

$X^2 = 70.07$ ; 4 d.f. ; $P < 0.01$ ; $\overline{C} = 0.76$

Table 11. Exposure to mass media as it affects adoption of improved practices, summer 1971.

| Level of adoption | Low Exposure | | Medium Exposure | | High Exposure | | Total | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Low | 21 | 30 | 6 | 16 | 2 | 5 | 29 | 20 |
| Medium | 27 | 38 | 8 | 21 | 12 | 29 | 47 | 31 |
| High | 23 | 32 | 24 | 63 | 27 | 66 | 74 | 49 |
| Total | 71 | 100 | 38 | 100 | 41 | 100 | 150 | 100 |

$X^2 = 18.75$ ; 4 d.f. ; $P < 0.001$ ; $\overline{C} = 0.45$

Table 12. Exposure to city life as it affects adoption of improved practices, summer 1971.

| Level of adoption | Highly exposed | | Little exposed | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Low | 14 | 11 | 15 | 88 | 29 | 19 |
| Medium | 45 | 34 | 2 | 12 | 47 | 32 |
| High | 74 | 59 | 0 | 0 | 74 | 49 |
| Total | 133 | 100 | 17 | 100 | 150 | 100 |

$X^2 = 54.72$ ; 2 d.f. ; $P < 0.001$ ; $\overline{C} = 0.77$

## APPENDIX B

**Part I. Questions Used to Measure «Knowledge of Agricultural Innovations»:**

1. Check the three major crops grown in your area
   1. Rice
   2. Wheat
   3. Sugercane
   4. Cotton
   5. Maize
   6. Any other (specify) _____

2. Do you know the names of one or two improved varieties of the first major crop grown in your area?
   1. Yes (specify) _____
      _____
   2. No

3. Do you know the names of one or two improved varieties of the second major crop grown in your area?
   1. Yes (specify) _____
      _____
   2. No

4. Do you know the names of one or two improved varieties of the third major crop grown in your area?
   1. Yes (specify) _____
      _____
   2. No

5. Do you know which fertilizers are mostly used in this area?
   1. Yes (specify) _____
      _____
   2. No

6. Do you know what are the fertilizer requirements per acre for the dalta pine variety of cotton?
   1. Yes (specify) _____
      _____
   2. No

7. How about the fertilizer requirement per acre for the Maxipak wheat variety?
   1. Yes (specify) _____
      _____
   2. No

8. What do you think are the advantages of using improved seed?
   1. Better yielding than local
   2. Disease resistant
   3. 1 and 2
   4. Any other (specify) _____
   5. Do not know

9. Do you know the major diseases and insects of the first major crop grown in your area?
   1. Yes (specify)
      Diseases _____
      Insects _____
   2. No

10. Do you know the major diseases and insects of the second major crop grown in your area?
   1. Yes (specify)
      Diseases _____
      Insects _____
   2. No

11. How about the major diseases and insects of the third major crop grown in the area?

1. Yes (specify)
   Diseases _____
   Insects _____
2. No

**Part II. Questions Used to Measure «Attitudes Toward Innovations»:**

1. Do you feel that insecticides and chemical sprays have some adverse effects on the quality of produce?
   1. Yes
   2. No
   3. Do not know

2. Which of the following best expresses your feelings about fertilizers?
   1. Very useful
   2. Somewhat useful
   3. Not useful at all
   4. Do not know

3. Which of the following best expresses your feelings about insecticides and chemical sprays?
   1. Very useful
   2. Somewhat useful
   3. Not useful at all
   4. Do not know

4. Would you advise others to use improved seed on their farms?
   1. Yes
   2. No

5. Would you advise others to use fertilizers?
   1. Yes
   2. No

6. What about insecticides and chemical sprays?
   1. Yes
   2. No

7. In general what is your opinion about improved seed?
   1. Very good
   2. Fairly good
   3. Not good

**Part III. Questions Used to Measure «Adoption of Improved Farm Practices»:**

1. Did you use the improved varieties for the first major crop you grow?
   1. Yes (specify) ———————
      ———————
   2. No

2. Did you use the improved varieties for the second major crop you grow?
   1. Yes (specify) ———————
      ———————
   2. No

3. Did you use the improved varieties for the third major crop you grow?
   1. Yes (specify) ———————
      ———————
   2. No

4. (If fertilizers were used, ask) Which fertilizers did you use and for which crop?

| Fertilizer | Crop |
|---|---|
| ——————— | ——————— |
| ——————— | ——————— |
| ——————— | ——————— |
| ——————— | ——————— |

5. (If chemicals were used, ask) Which ones did you mostly use and for which disease or insect?

| **Sprays and/or insecticides** | **Reasons** |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

6. How would you rate yourself in relation to other farmers in your village with respect to adoption of new agricultural ideas?
    1. Among the first to adopt
    2. Above average
    3. Average
    4. Below average
    5. Among the last to adopt

**Part IV. Questions Used to Measure «Participation in Extension-type Activities»:**

1. How often have you contacted the extension agent in your area and received agricultural information from him during last year?
    1. Very often (specify number) _____
    2. Occasionally (specify number) _____
    3. Never

2. How often have you attended the demonstrations which were conducted by the agent in your village during last year?
    1. Very often (specify number) _____
    2. Occasionally (specify number) _____
    3. Never